Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

186. Proposed by J. R. HITT, Professor of Mathematics, San Marcos, Tex.

If two sides of a triangle and its in-circle be given in position, the envelope of its circum-circle is a circle (*Mannheim*). [From Casey's *Sequel to Euclid.*]

CALCULUS.

150. Proposed by E. B. ESCOTT, Instructor in Mathematics, University of Michigan, Ann Arbor, Mich.

Find total area between the curve $x^4y-x^2+4y-1=0$ and the x-axis.

151. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

Integrate the differential equation: $xy\frac{\partial^2 z}{\partial x.\partial y}=bx\frac{\partial z}{\partial x}+ag$.

MECHANICS.

140. Proposed by J. F. LAWRENCE, A. B., Professor of Mathematics, Rogers Academy, Rogers, Ark.

A long row of particles, each mass m, is placed on a smooth horizontal table. Each is connected with the two adjacent ones by similar light elastic strings of natural length l. They receive small longitudinal disturbances such that each of them proceeds to perform a harmonic oscillation. Prove that there will be two waves of vibration in opposite directions with the same velocity, viz, $l'\sqrt{\frac{E}{ml}}\frac{q}{\pi}\sin\frac{\pi}{q}$, when l' is the average distance between two successive particles, q the number of intervals between two particles in the same phase, and E the modulus of elasticity. [*Mathematical Tripos*, 1873.]

141. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, Gloucestershire, England.

A simple pendulum hangs from a bicycle moving in a straight line. What deflection is produced by putting on the brake so as to exert on the machine a force equal to the nth of its weight?

DIOPHANTINE ANALYSIS.

101. Proposed by HARRY S. VANDIVER, Bala, Pa.

Prove that it is impossible to find integral values for x, y, and z such that the relation $x^2y+xz^2=y^2z$ is satisfied.

N. B. Problems in this department beginning with December number should be renumbered; those in December number being 96 and 97, respectively; January number, 98 and 99; February number, 100.

AVERAGE AND PROBABILITY.

125. Proposed by L. C. WALKER, A.M., Professor of Mathematics, Petaluma High School, Petaluma, Cal.

A circle with unknown radius is described with its center at the extremity of the major axis of a given ellipse. Required the average area common to the circle and the ellipse.

126. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

Find the average ellipse inscribed in a triangle, so that the sides of the triangle are tangent to the ellipse.

MISCELLANEOUS.

126. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

The declination of a certain fixed star is 12° 40′. Its altitude was observed one day to be 16° 40′. Three hours and twenty-four minutes later it was found to be 40° 20′. Find the latitude of the place of observation.

127. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

Show how to calculate the velocity of an electrical discharge between a cloud and the earth. Is this velocity a function of the quantity of electricity discharged?

◆

BOOKS AND PERIODICALS.

Elementary Treatise on Navigation and Nautical Astronomy. By Eugene L. Richards, M. A., Professor of Mathematics in Yale University. 16mo. Cloth, 173 pages. Price, $1.00. New York and Chicago: The American Book Co.

This is a neat little work dealing with some interesting problems in Navigation. It is elementary and clear in its treatment of subjects, and can therefore be easily read by any one having a knowledge of geometry and trigonometry.

Elements of Plane Geometry. By Alan Sanders, Hughes High School, Cincinnati, Ohio. 8vo. Cloth. Price, $1.00. New York and Chicago: The American Book Co.

This book does not differ very essentially from a great number of recent text-books on geometry. It contains a large list of well-selected exercises for original work on the part of the student, and the demonstrations and suggestions are good. The mechanical make-up of the book is first-class.

Vector Analysis. A Text-book for the Use of Students of Mathematical Physics. Founded upon the Lectures of J. Willard Gibbs, Ph. D., LL. D., Professor of Mathematical Physics in Yale University. By Edwin Bidwell Wilson, Ph. D., Instructor in Mathematics in Yale University. 8vo. Cloth, xviii+436 pages. Price, $4.00, net. New York: Charles Scribner's Sons.

This work belongs to that series of publications known as the "Yale Bicentennial Publications," and is the largest treatise thus far written on this subject in America. The body of the work is divided into six chapters of which the first treats of Addition and Scalar Multiplication; the second of Direct and Akew Products of Vectors; the third of Differential Calculus of Vectors; the fourth of Integral Calculus of Vectors; the fifth of Linear Vector Functions; and the sixth of Rotations and Strains; chapter seven deals with Miscellaneous Applications. This work will be of great value to the mathematician as well as the mathematical physicist.